

## AMENDMENTS TO THE CLAIMS

---

1 (currently amended): A RAID system able to function with undiminished capacity despite the failure of any storage array controller comprising:

n active storage array controllers, when n is from 2 to 20,  
each active storage array controller capable of periodically generating a signal  
termed a heartbeat when the storage array controller is operational,  
n arrays of storage units, each active storage array controller connected by at least one connector to one array of storage units,

each active storage array controller controlling one or more arrays of storage units,  
and

one only passive storage array controller,  
the passive storage array controller capable of activation on the cessation of a  
heartbeat generated by one of the active storage array controllers.

the passive storage array controller connected by at least one connector to each active storage array controller,

the passive storage array controller able to control any one of the arrays of storage devices in the case of failure of an active storage array controller.

2 (currently amended): A RAID system able to function with undiminished capacity despite the failure of a storage array controller comprising:

three active storage array controllers,  
each active storage array controller capable of periodically generating a signal  
termed a heartbeat when the storage array controller is operational,  
three arrays of storage devices units, each active storage array controller connected by at least one connector to and controlling one or more arrays of storage units,  
each array of storage units comprising a multiplicity of storage units and at least one connector between each storage unit and the active storage array controller which

controls that array, each array comprised of a multiplicity of active storage units and one or more parity storage units,

one passive storage array controller,

the passive storage array controller capable of activation on the cessation of a heartbeat generated by one of the active storage array controllers,

each active storage array controller connected by at least one connector to the passive storage array controller, and

the passive storage array controller able to assume the identity of a failed active storage array controller and to control the at least one array of storage units controlled by the failed active storage array controller.

3 (original): The RAID system of claim 1 wherein two connectors connect each storage unit with one storage array controller.

4 (original): The RAID system of claim 1 wherein one connector connects each storage unit with each of greater than one storage array controller.

5 (original): The RAID system of claim 2 wherein two connectors connect each storage unit with one storage array controller.

6 (original): The RAID system of claim 2 wherein one connector connects each storage unit with each of greater than one storage array controller.

7 (original): The RAID system of claim 1 wherein each active storage array controller is connected by at least one connector to two adjacent active storage array controllers, forming a ring of active storage array controllers.

8 (original): The RAID system of claim 2 wherein each active storage array controller is connected by at least one connector to two adjacent active storage array controllers, forming a ring of active storage array controllers.

9 (currently amended): The process of maintaining the channel capacity of a RAID system having storage array controllers which control direct access storage devices

(DASD) and which generate signals termed heartbeats when the storage array controllers are operational when an active storage array controller fails comprising the steps of:

- a. ceasing the emission of the heartbeat by a defective active storage array controller,
- b. detecting the cessation of the heartbeat by a defective active storage array controller and emission of an activation signal by a reporter active storage array controller,
- c. detecting the activation signal by a passive storage array controller and assuming the identity of the defective active storage array controller by the passive storage array controller,
- d. identifying the DASD of the defective storage array controller by the passive storage controller using a table on each DASD,
- e. assuming control of the DASD of the defective storage array controller by the passive storage controller.

10 (original): The method of claim 9 further comprising after step e:

- f. emitting a defective storage array controller signal by the reporter storage array controller or the passive storage array controller.

11 (currently amended): The process of maintaining the channel capacity of a RAID system having storage array controllers which control direct access storage devices (DASD) and which generate signals termed heartbeats when the storage array controllers are operational when an active storage array controller fails comprising the steps of:

- a. ceasing the emission of the heartbeat by a defective active storage array controller,
- b. detecting the cessation of the heartbeat by a defective active storage array controller by a passive storage array controller,

*XJ*

- c. assuming the identity of the defective active storage array controller by the passive storage array controller,
- d. identifying the DASD of the defective storage array controller by the passive storage controller using a table on each DASD,
- e. assuming control of the DASD of the defective storage array controller by the passive storage controller.

12 (currently amended): The method of claim 11 further comprising after step e:

- f. emitting a defective storage array controller signal by ~~the reporter storage array controller or the passive storage array controller.~~

13 (new) The process of maintaining the channel capacity of a RAID system having storage array controllers which control direct access storage devices (DASD) and which generate signals termed heartbeats when the storage array controllers are operational when an active storage array controller fails comprising the steps of:

- a. ceasing the emission of the heartbeat by a defective active storage array controller,
- b. detecting the cessation of the heartbeat by a defective active storage array controller and emission of an activation signal by a reporter active storage array controller, and
- c. detecting the activation signal by a passive storage array controller and assuming the identity of the defective active storage array controller by the passive storage array controller, or
- d. detecting the cessation of the heartbeat by a defective active storage array controller by a passive storage array controller, and
- e. assuming the identity of the defective active storage array controller by the passive storage array controller,
- f. identifying the DASD of the defective storage array controller by the passive storage controller using a table on each DASD,

*12*  
g. assuming control of the DASD of the defective storage array controller by the passive storage controller.

14 (new): The method of claim 13 further comprising after step g:

h. emitting a defective storage array controller signal by the reporter storage array controller or the passive storage array controller.